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COGNITIVE DISSONANCE AND MISATTRIBUTION

by



EDWARD F. WRIGHT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Cognitive Dissonance and Misattribution" submitted by Edward Frederick Wright in partial fulfilment of the requirements for the degree of Master of Arts.

ABSTRACT

This study was designed primarily to investigate whether persons who misattributed dissonance tension to an alternate source would re-attribute this tension to the inconsistent cognitions. This test was conducted under conditions in which the evidential basis of the misattribution of dissonance tension was later negated. Female undergraduates were initially informed that a pill (placebo) they had ingested produced either unpleasant side effects (misattribution condition) or no side effects (attribution condition). Participants were given high choice in writing a counterattitudinal essay and then half the subjects in each of the two conditions were informed that the initial designation of the pill's side effects had been incorrect. Those informed initially that the pill had no side effects were told that the pill, in fact, had unpleasant side effects. Similarly, those informed initially that the pill had unpleasant side effects were told that it produced no side effects. Measures of subjects' attitudes toward the issue addressed in the essay indicated that the participants apparently re-attributed their tension after being informed of the altered status of the external tension source. It was concluded that neither attributions of dissonance tension to the inconsistent cognitions nor misattributions of the tension to the alternate source persevere in this context.

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According to the theory of cognitive dissonance (Festinger, 1957), whenever a person holds two cognitive elements, i.e., beliefs, opinions, or ideas, that are psychologically inconsistent with one another, a negative motivational state is aroused. The individual presumably is then motivated to reduce this state of dissonance arousal by making the cognitions more consonant with each other. For example, if a person holds attitude A but acts in accordance with attitude B, a contrary position, a dissonant relationship comprising the elements "I believe in A"; "I acted against A", is formed. One could reduce this state of dissonance by shifting one's attitude in the direction of attitude B, psychologically revoking the action related to attitude B, or adding a third cognition C that renders this relationship unimportant or irrelevant. Considerable support has been obtained for this prediction of dissonance theory (Wicklund & Brehm, 1976).

Since the original statement by Festinger, the theory of cognitive dissonance has undergone a number of revisions (for a review, see Greenwald & Ronis, 1978). Zanna and Cooper (1976) have recently suggested a modification to the theory based on the work of Schachter and his associates (1962, 1964). According to Schachter and Singer's (1962) theory of cognitive labelling, people use cues present in the environment to label a state of undifferentiated arousal as a particular emotion. They based this conclusion, in part, on their finding that physiologically aroused subjects who were uninformed or misinformed about the physiological effects of epinephrine injections were more verbally hostile in the presence of an angry confederate or were more euphoric in the presence of a happy confederate than were subjects who

were informed about the physiological effects of the drug. Accordingly, Schachter and Singer reasoned that arousal states, such as an emotion, are labelled as a consequence of a cognitive process. In line with Schachter's reasoning, Zanna and Cooper argued that if dissonance is an arousal state, then the association of this arousal with the inconsistent cognitions should also involve a cognitive labelling process. Furthermore, Zanna and Cooper suggested that if dissonance arousal is identified and labelled in this manner, dissonance theory should be expanded to encompass this component process.

The procedure employed by Zanna and Cooper to investigate the nature of dissonance tension evolved from the work of Nisbett and Schachter (1966), and Ross, Rodin and Zimbardo (1969). These investigators reasoned that if labelling of arousal occurs as a result of a search for external cues, then one should be able to induce people to relabel their arousal in terms of certain specific external cues. For example, Nisbett and Schachter examined the notion that naturally occurring states of arousal, induced by threat of shock, could be erroneously attributed to a nonemotional source if people were led to expect arousal symptoms from the latter source. Nisbett and Schachter found that subjects who were led to believe that an ingested placebo pill produced feelings of autonomic arousal tolerated more intense shock than persons who were informed that the pill had non-arousing effects. On the basis of these findings, Zanna and Cooper reasoned that Nisbett and Schachter's experimental paradigm could be useful in determining whether particular events produce autonomic arousal. They argued that if the 'state' produced by a particular event is amenable to cognitive labelling or relabelling in accordance with cues associated

with an external arousal source, then it can be inferred that the event produces autonomic arousal. Hence they argued that if persons in whom dissonance was aroused misattributed their state to an arousing source, then dissonance must have arousal properties.

To examine this notion, Zanna and Cooper (1974) employed a variant of Nisbett and Schachter's experimental paradigm (which is referred to as the misattribution paradigm) in which three groups of subjects were given a placebo pill. Each group was told that the drug had one of the following side effects: an arousing effect, a tranquilizing effect, or no effect at all. Dissonance was generated in all three groups by asking subjects to write an essay counter to their pretested beliefs, but providing them with little justification for doing so. Under these circumstances dissonance is typically reduced through a shift in attitudes toward the attitude expressed in the essay (Festinger and Carlsmith, 1959). Zanna and Cooper hypothesized that subjects who were given the opportunity to misattribute their state to the external arousal source would not label their state as dissonance. That is, when given a post-manipulation attitude measure these subjects would not shift their attitudes in the direction of the attitude expressed in the essay. Their results were consistent with this prediction. Unlike subjects in the conditions in which the pill was described as having either tranquilizing or no side effects, participants who were told that the pill was arousing did not shift their attitudes in the direction of the attitude expressed in the essay. Consequently, Zanna and Cooper concluded that dissonance is, indeed, a state of arousal. Furthermore, Zanna and Cooper later concluded on the basis of a number of similar findings that a cognitive labelling process plays an essential role in the cognitive dissonance process (Zanna and Cooper, 1976).

Empirical findings consistent with this view of the dissonance process have also been obtained by Pittman (1975) and Drachman and Worchel (1976).

While the experiments on the misattribution of dissonance arousal were designed primarily to investigate the nature of dissonance tension and the role of cognitive labelling in the dissonance process, some researchers have attached additional implications to these research findings. Specifically, Zanna and Cooper (1976) and Drachman and Worchel (1976) have argued that these results provide evidence that misattribution of dissonance arousal serves as a means of dissonance reduction. Since the provision of an opportunity to misattribute arousal eliminated the cognitive dissonance attitude change effect, these investigators reasoned that dissonance is reduced by misattribution. It can be argued, however, that Zanna and Cooper and Drachman and Worchel have stated their conclusion imprecisely. Since the Schachterian model of arousal, utilized by Zanna and Cooper (1974), assumes that undifferentiated arousal acquires a particular label only after a cognitive labelling process, the misattribution seems only to prevent the labelling of the tension as dissonance. Consequently, misattribution would 'reduce' dissonance only to the extent that it prevents the labelling of the tension as dissonance. Zanna and Cooper and Drachman and Worchel's argument rests, then, on the assumption that the misattribution perseveres, precluding a re-attribution of the tension to the inconsistent cognitions. However, neither the Zanna and Cooper (1974) experiment nor the Drachman and Worchel (1976) study examined the perseverance characteristics of the misattribution of dissonance tension. Furthermore, dissonance theory states that dissonance tension will persist unless or until the inconsistent cognitions are altered. The implication of this statement is that dissonance tension will ultimately be attribut-

ed to the inconsistent cognitions despite prior misattribution of the tension. It appears, then, that this attempt to assess the impact of misattribution on the dissonance process has been made prematurely.

Recently, however, Higgins, Rhodewald and Zanna (1979) conducted a study that addressed the issue of whether or not misattributed dissonance arousal is later re-attributed to the inconsistent cognitions. These investigators conducted a partial replication of Zanna and Cooper's (1974) experiment in which subjects who were given an alternative source to which to misattribute 'dissonance' arousal were administered three post-measures of attitude change over a two week period. The results of this experiment conformed to their hypothesis that the misattribution persists over an extended period of time. It was therefore concluded that misattributed dissonance arousal is not later re-attributed to the inconsistent cognitions. However, this conclusion was qualified by the finding that after a two week period, when attention was drawn to the inconsistent cognitions, subjects shifted their attitudes in a direction predicted by dissonance theory. Higgins et al. finally concluded that while re-attribution of misattributed dissonance arousal can occur under conditions in which attention is drawn to the inconsistent cognitions by an external agent (the experimenter), subjects do not of their own accord re-attribute this arousal to the inconsistent cognitions. While this conclusion can be drawn from the Higgins et al. findings, it is important to note that the study was not designed to test this assumption. Furthermore, their experiment included certain features that may be detrimental to re-attribution of dissonance tension. For example, subjects were given little motivation and also little time to reflect upon the inconsistent cognitions. As Festinger (1957) has noted, the amount of dissonance motivation experienced by a person is directly related to the importance, to the individual, of the

cognitions comprising the dissonant relationship. The dissonant cognitions in the Higgins et al. study, pertaining to the military draft, may have induced only a minimal amount of cognitive dissonance motivation for the subjects. If an experiment of this type was to provide an exacting test of this re-attribution of arousal hypothesis, the amount of dissonance motivation experienced by subjects would have to be varied. With regard to the second feature of the Higgins et al. procedure, after subjects were administered the first post-measure of attitude change, they were kept cognitively distracted from the dissonant cognitions for the duration of the experimental session. Zanna (1975) has demonstrated that if subjects are distracted from dissonant cognitions they will show no evidence of dissonance reduction. Under these circumstances, then, it is not surprising that the re-attribution did not occur. Hence, the Higgins et al. study offers little to an understanding of whether people re-attribute misattributed dissonance arousal to the inconsistent cognitions.

Examination of the arguments advanced thus far leads to the following points. Zanna and Cooper (1976), and Drachman and Worchel (1976), have argued that misattribution of arousal reduces dissonance. The implication of this statement is that after misattribution, dissonance is not re-attributed to the inconsistent cognitions and reduced through alteration of the inconsistent cognitions. This position was criticized on the grounds that Zanna and Cooper failed to demonstrate or specify how this re-attribution might be impeded by misattribution. Research findings on the question are incomplete. It has been demonstrated that under certain conditions re-attribution of misattributed arousal to the inconsistent cognitions does not occur. In an experiment

employing the misattribution paradigm, Higgins et al. (1979) found no evidence of the attitude change predicted by dissonance theory on several post measures of attitudes. It has also been shown, however, that re-attribution of arousal can occur if attention is drawn to the inconsistent cognitions. Higgins et al. found that when the experimenter provided subjects with the opportunity to recall their counterattitudinal behavior, they shifted their attitudes in the direction predicted by dissonance theory. It has therefore not been established whether subjects will, of their own accord, re-attribute misattributed dissonance arousal to the inconsistent cognitions. Consequently, the relationship of misattribution to dissonance reduction remains a matter of speculation at this time.

It appears that the confusion existing in this area of research stems from a lack of understanding of the processes by which attributions about arousal are both formulated and altered. Owing to the absence of a guiding theoretical framework, researchers in the area have sometimes based claims on untested and unspecified assumptions. As a consequence, insufficient consideration has been given to processes that might endanger the positions that the various theorists wish to advance. For example, Zanna and Cooper seem to have assumed that the misattribution of dissonance arousal to the alternate source will continue to persevere despite evidence contrary to the information upon which the misattribution was based. That is, they have assumed that subjects will 'ignore' evidence that the misattributed arousal is due to the inconsistent cognitions. Similarly, a dissonance argument depends upon the untested assumption that attributions once formed do not necessarily persevere. The question of whether the misattribution does persevere despite

invalidation of its evidential basis seems, then, to be critical to an understanding of the relationship between misattribution and dissonance reduction.

The assumption that the misattribution of dissonance arousal perseveres despite invalidation of its evidential basis is consistent with the views of Ross and Lepper, the first researchers to investigate the perseverance characteristics of particular self attributions. Research by Ross, Lepper and Hubbard (1975) and Lau, Lepper and Ross (1976) suggests that errors in initial self-perceptions are difficult to reverse and may survive even the complete negation of their evidential basis. The mechanisms proposed by Ross (1978) to account for this phenomenon are 'distortion' and 'autonomy'. Ross contends that people give considerable weight to evidence consistent with initial impressions and little weight to evidence inconsistent with these impressions. Through this process of evidence distortion, the impression comes to enjoy the support of additional evidence that is seemingly independent of the information upon which the original impression was based. As a consequence, the validity of the information that originally formed the basis of the impression could be reduced without affecting the perceived validity of the impression.

While Ross' (1978) explanation of the phenomenon is somewhat superficial, i.e., he does not explain why or how this distortion takes place, it at least offers some means for understanding how an attribution or misattribution of arousal might persevere. Ross' argument suggests that the misattribution of dissonance arousal could reach a stage of autonomy and re-attribution of arousal to the inconsistent cognitions might not occur in spite of the complete

negation of the basis upon which the misattribution was formed.

Support for the view that the misattribution of dissonance arousal may persevere also comes from the cognitive dissonance research of Lepper, Zanna and Abelson (1970). This research indicates that once a response to dissonance occurs, an individual is very unlikely to adopt another dissonance reduction response despite the provision of information to the individual which suggests that another response will more efficiently lead to dissonance reduction. According to these investigators, this effect occurs because dissonance has the character of problem solving, i.e., a satisfied problem solver is reluctant to reconsider his/her solution when confronted with new information or other possibilities because s/he has developed a set toward the solution as perfectly satisfactory. However, in offering this explanation, Lepper et al., like Ross (1978), do little more than give a redescription of the phenomenon. Consequently, the support for the present misattribution perseverance position that exists within the dissonance area is merely suggestive. Not all research findings within the area, however, are supportive of Ross' and Lepper's views. For example, Gotz-Marchand, Gotz and Irle (1974) have obtained evidence that conflicts with the Lepper et al. (1970) findings. Gotz-Marchand et al. found that individuals opted for a second response to dissonance if they were made aware of a more efficient means of dissonance reduction. While this finding is not directly related to the re-attribution of arousal issue, it does suggest that people will not resist altering an initial response to dissonance. In summary, then, the misattribution-perseverance position is consistent with the views of some theorists in the area and inconsistent with the views of others.

The purpose of the current investigation was to provide some basis upon which to infer whether persons who have misattributed dissonance arousal to an alternate source will re-attribute their arousal to the inconsistent cognitions. As concluded previously, the question critical to an understanding of whether such a re-attribution will occur is whether the misattribution of dissonance arousal perseveres when the information that formed the basis of the misattribution is invalidated. This investigation therefore provided an empirical test of the assumption that the misattribution of dissonance arousal perseveres despite negation of its evidential basis. It was concluded that such a test could be made if the following conditions were met. First, the experiment must provide participants with an alternate source to which to misattribute dissonance arousal. Second, the experiment must be designed such that participants could later be informed that the source to which they misattributed arousal was not a tension-producing source. It was decided that the procedure employed by Zanna and Cooper (1974) could be adapted for such a test. A placebo pill could be described as tension-producing, but later, after subjects had misattributed arousal to the pill, it could be described as non-tension-producing. Consequently, the evidential basis upon which the misattribution was based could be negated.

Participants in each of four experimental conditions were given an initial and a subsequent description of the side effects of a placebo drug, and they were exposed to a manipulation designed to generate dissonance. The drug was described as having either unpleasant side effects or no side effects. In one condition subjects were informed twice that a pill they had ingested had no side effects

(No effects/No effects condition). In a second condition, subjects were informed twice that the pill had unpleasant side effects (Unpleasant effects/Unpleasant effects condition). In two other conditions, subjects were initially informed that the pill had either no side effects or unpleasant side effects, and later this initial description was reversed (No effects/Unpleasant effects; Unpleasant effects/No effects conditions). In these latter two conditions, subjects were informed that an error had been made in the original designation of the side effects of the drug. In a control condition, subjects were neither given a pill nor exposed to the dissonance generation manipulation. These subjects simply completed a questionnaire designed to tap attitudes on an issue relevant to the dissonance manipulation.

Aside from giving subjects a second designation of the side effects of the drug, the design of the experiment was similar to other experiments employing the misattribution paradigm. However, on the basis of a finding that dissonance is an aversive, rather than an arousing state (Higgins et al., 1979), the alternate source to which dissonance was expected to be attributed was described as being "unpleasant" rather than "arousing". The index of attribution to the inconsistent cognitions was the subjects' attitudes on a post-manipulation attitude measure regarding the issue addressed by the essay. It was predicted that subjects who attributed their tension to the inconsistent cognitions would hold attitudes consistent with the attitude expressed in the essay. The test for misattribution perseverance consisted simply of comparing the attitudes of subjects who were originally told that the pill was unpleasant but later told that it was not, to the attitudes of the subjects who were told only that the pill was unpleasant. If the misattribution perseveres, then

telling subjects that the pill is 'no longer' unpleasant should have no effect on their attributions. In that case, both groups should show little agreement with the attitude expressed in the essay.

Since the goal of this research was to determine whether already attributed/misattributed tension would be re-attributed to another source, it was necessary to insure that subjects, indeed, attributed tension to the source specified by the initial information. Consequently, two pre-test groups of subjects were included in the study to investigate whether or not subjects experiencing dissonance would misattribute their tension to the pill. These two groups of subjects were both administered a pill and informed that it produced unpleasant side effects. Subjects in one of the two groups were then exposed to dissonance generating manipulations. It was anticipated that the subjects in this latter group would attribute more tension to the pill on a discomfort measure than would subjects in the other condition. If this effect was obtained, it could later be concluded that attributions of tension to the source specified by the subsequent information were indeed re-attributions.

This design provided the opportunity to test a second hypothesis: that the attribution of tension to the inconsistent cognitions does not persevere. In addition to making the test of attribution perseverance within this context more general, this test indicates whether it is possible to misattribute tension that has already been attributed to the inconsistent cognitions. If the attribution of tension to the inconsistent cognitions is found to persevere, then it is imperative that alternate tension sources be provided prior to the dissonance generation in misattribution of dissonance tension experiments.

The major hypothesis of this experiment was that the misattribution

of dissonance tension does not persevere. Hence, it was predicted that subjects who were told that the pill had unpleasant side effects and then no side effects would show greater agreement with the attitude expressed in the essay than would subjects who were only told that the pill had unpleasant side effects. A second hypothesis of this experiment was that neither attributions to the inconsistent cognitions nor attributions to the alternate source persevere in this context. Hence it was predicted that subjects who were subsequently told that the pill had no side effects would show more agreement with the attitude expressed in the essay than would subjects who were subsequently told that the pill had unpleasant side effects, regardless of the initial description of the drug's side effects.

Method

Subjects

Subjects were 113 female undergraduates at the University of Alberta recruited from introductory psychology classes. Females over the age of thirty were excluded from the sample as pilot testing revealed a high rate of suspiciousness concerning the pill among members of this group. All but two of these subjects consented to take part in the study. All but two of the remaining 111 subjects agreed to write the essay.

Design

The experiment was a 2 (Initial vs. Subsequent description) X 2 (No **effects** vs. Unpleasant effects) plus control design with 16 subjects/condition. Three pretest groups of subjects were also included in the experiment. Measures of subjects' attitudes on an item relevant to the dissonance manipulation were obtained from one group of pretest subjects. Two other pretest groups were included in the experiment to determine whether dissonance is indeed misattributed to the alternate tension source.

Procedure

Pretests. Pretest measures of attitudes towards the institution of 6:30 A.M. classes at the University of Alberta were collected two weeks before the experiment began from a group of 15 subjects drawn from the same population as the experimental subjects. These subjects were simply asked to complete a questionnaire and to place it in an envelope. Two other pretest groups, each comprised of 7 subjects, were run immediately before the main experiment was conducted. These two groups of subjects were exposed to the same procedures as the experimental subjects with the

following exceptions. While both groups of subjects were informed that the pill had "unpleasant" side effects and one of the groups was exposed to the dissonance manipulation, they were not given attitude questionnaires to complete. They were given instead questionnaires "for the experimenter's purposes" which included a question asking subjects to rate their feeling of the degree of unpleasantness of the pill's side effects. Appendix A contains a copy of this experimental questionnaire. They were told to place the completed questionnaire in an envelope for reasons of confidentiality. The purpose of this pre-measure was to determine if subjects would indeed misattribute their dissonance tension to the pill. It was predicted that the subjects who were given the opportunity to misattribute dissonance tension to the pill would rate the pill as being more unpleasant.

Main Experiment. The procedure was basically the same as that described in Zanna et al. (1976). One or two subjects were run per session and the assignment of subjects to conditions within sessions was conducted randomly. (The frequency of two subject-experimental sessions was 34. The frequency of one subject-experimental sessions was 31.) When subjects arrived at the laboratory they were each taken into their own soundproof room. The purported purpose of the study was to test the effects on university-aged populations of a compound that ostensibly had improved the memory of aged subjects in previous geriatric studies. After being told that most subjects in the study would be administered a drug, subjects read a supposed letter from the Psychology department asserting the drug's total safety. Appendix B contains a copy of this letter. Subjects were then given the first memory task, consisting of having to write down as many out

of fifteen nonsense syllables as could be recalled, in any order, after a three minute exposure to the sequence of syllables on a sheet of paper. Appendix C presents the memory task materials.

Initial designation of drug side effects. After signing a consent form that included a description of the drug's 'properties', each experimental subject ingested the drug (actually a placebo). Two different consent forms were used to create the different 'initial information' conditions. Appendices D and E contain copies of the two consent forms. The experimenter remained present to elaborate if necessary on the side effects and to encourage continued participation in the study, again, if necessary. Subjects assigned to the 'unpleasant side effects' condition were informed that the drug may produce 'a feeling of mild unpleasantness or discomfort prior to total absorption'. These subjects were further told that this side effect would wear off in 'about ten minutes'. Subjects in the 'no side effects' condition were explicitly told to expect no side effects from the drug.

Subjects then read a supplementary information sheet, enclosed in an envelope, that was designed to increase the impact of the cover story. Appendix F contains a copy of the supplementary information sheet. The sheet stressed the fact that special permission had been received from the department to use real rather than placebo pills in this study, re-stated the side effect properties of the capsules, and requested the name and address of participants interested in obtaining the results of the study. (Control subjects were simply given an attitude questionnaire to fill out upon completion of the memory task. Appendix G contains a copy of the attitude questionnaire. This questionnaire contained an item relevant to the dissonance manipulation.)

Dissonance manipulation. After subjects had signed their consent forms, ingested their capsules and read the supplementary information sheet, the experimenter explained that "we now have 10 or 15 minutes before the second memory task" and that the department had "another study going on about opinion research". All subjects were then exposed to a manipulation designed to create dissonance. They were told that their participation in this other study would be greatly appreciated although the decision to participate was entirely their own.

In all experimental conditions the experimenter then explained that the department was soliciting essays on a number of relevant issues and felt that the best way to collect arguments on both sides of these issues was to have people write on only one side of the issue. Subjects were then asked to write in favour of 6:30 A.M. classes being instituted at the University of Alberta.

After agreement to write the essay the experimenter left the room to get a booklet for the subject, waited two minutes and returned with the booklet, a questionnaire and an envelope.

Subsequent designation of drug side effects. Half the subjects in each of the two initial instruction conditions were then told that a 'discovery' had been made. The subjects were reminded that two forms of the drug were being used, one with a side effect and one without side effects. The experimenter then explained that he had mistakenly given the subject the 'other' form of the drug. Hence those subjects who were initially told that there were side effects to the drug were informed that there were not side effects, and vice versa. These subjects were not required to sign new consent forms. The other half of the subjects were simply reminded of the initial designation of the

drug's side effects. Next, subjects were directed to an attitude questionnaire that "the department would also like the volunteer essay writers to complete, first". The questionnaire allegedly measured attitudes toward the complete range of issues with which the Psychology department was presently concerned. The critical issue on 6:30 A.M. classes was imbedded in this ten item questionnaire. Subjects were told that in order for the questionnaire to be kept confidential they should seal it in the envelope provided and then begin writing the essay. Once subjects had completed the attitude questionnaire they were told to stop writing the essay and probed for suspiciousness. The suspicious probe consisted of a series of funnel-type questions leading to the question "Did you see any connection between the memory experiment and the opinion task?". Subjects were then informed that the experiment was over and were fully debriefed.

Results

Pretest Measures

The pretest measure of attitudes toward 6:30 A.M. classes being instituted at the University of Alberta revealed that only 1 of 15 subjects held a favourable view of this position. The mean attitude score for subjects in this sample was 2.5 on an 11-point scale.

An examination of the second pretest measures revealed that, as predicted, a greater degree of tension was attributed to the pill in the dissonance condition ($\bar{M} = 1.9$) than in the no dissonance condition ($\bar{M} = 1.1$) ($t(12)=2.85$, $p<.01$, one-tailed). This suggests that subjects in whom dissonance is generated are likely to attribute their tension to the drug before this 'tension source' is later removed.

Attitudes Toward 6:30 A.M. Classes

A 2 X 2 analysis of variance test was performed on the scores representing subjects' attitudes toward 6:30 A.M. classes. Only a marginally significant main effect for Subsequent Information ($F(1,36)=3.19$, $p<.08$) was found. In order to provide a more adequate test of the hypothesis, a decision was made to increase the sample size. Since the analysis of variance test is based on the assumption that all subjects in the analysis are randomly assigned to conditions, the addition of subjects was carried out according to the following procedure. The data from the additional subjects was organized into a 2 X 2 replication of the experiment with 6 subjects per condition. A 2 X 2 analysis of variance test was then performed on the data with "Replication" serving as the third factor. The analysis of variance of these quantities is summarized in Table 1. As indicated in Table 1, the Replication main effect, the Initial Information X Replication interaction, the Subsequent Information X Replication interaction, and the Initial Information X Subsequent Informat-

Table 1

Analysis of Variance Summary Table of Subjects' Attitudes
Toward 6:30 A.M. Classes**

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Initial Description	1	0.00	0.00
Subsequent Description	1	34.50	5.32*
Replication	1	16.20	2.50
Initial X Subsequent	1	15.00	2.31
Initial X Replication	1	0.14	0.02
Subsequent X Replication	1	1.80	0.28
Initial X Subsequent X Replication	1	2.86	0.44
Error	56	6.48	

* $p < .05$

**Replication factor represents the added subjects (6 subjects per condition).

ion X Replication interaction all failed to reach significance. Consequently, it was concluded that the data obtained from the subjects that were added to the analysis and the data obtained from the original subjects were drawn from the same population. It was therefore argued that although all the subjects in this study were not randomly assigned to conditions within one experimental session, the data could be collapsed across the two replications and analyzed using a 2 X 2 analysis of variance procedure.

The cell means of attitudes toward 6:30 A.M. classes are represented in Table 2. The analysis of variance of these quantities is summarized in Table 3. The analysis of variance revealed only a significant main effect for Subsequent Information ($F(1,60)=5.39, p<.05$). This result confirms the second hypothesis of this experiment. According to this hypothesis, subjects in the subsequent-no side effects condition would show more agreement with the attitude expressed in the essay than would subjects in the subsequent-unpleasant side effects condition. These results indicated that subjects apparently attributed their tension to the source specified by the subsequent information after being given the opportunity to make an attribution to either the inconsistent cognitions or the alternate source of tension.

A test using an a-priori contrast between the means for the Unpleasant effects/Unpleasant effects condition and the Unpleasant effects/No effects condition was also conducted. The analysis revealed that there was greater agreement with the target issue ($t(30)=2.68, p<.01$, one-tailed) in the latter condition than in the former condition. This finding

Table 2

Attitudes Toward 6:30 A.M. Classes on Scores for Combined Samples*

		Initial Description of Side Effects		
		None	Unpleasant	Control
Subsequent Description of Side Effects	None	4.5 (4.9)**	5.4 (5.8)	2.1 (2.2)
	Unpleasant	4.0 (4.7)	3.0 (3.1)	

*A high score indicates greater agreement with the position expressed in the essay. Midpoint of scale = 6.

**First sample value with $n = 10$ subjects per condition.

Table 3

Analysis of Variance Summary Table of Subjects' Attitudes
Toward 6:30 A.M. Classes**

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Initial Description	1	0.02	0.00
Subsequent Description	1	34.52	5.39*
Initial X Subsequent	1	15.02	2.35
Error	60	6.40	

* $p < .05$

**Data collapsed across replications

supports the major hypothesis of this experiment. Subjects who were provided with the opportunity to misattribute their tension to the alternate source apparently re-attributed their tension to the inconsistent cognitions when the alternate source was removed.

Additional tests on the data included a comparison using the Dunnett procedure (cf. Dunnett, 1955) that revealed that the dissonance manipulation was effective in this experiment. The attitudes of subjects in the No effects/No effects condition toward 6:30 A.M. classes were significantly more favourable ($t(75)=2.70$, $p<.05$, one-tailed) than those expressed by the subjects in the control condition.

Discussion

The results for the attitude measures conformed to what was predicted. Subjects who apparently misattributed their dissonance tension to the alternate source later re-attributed this tension to the inconsistent cognitions when the drug 'ceased' to be a viable source of tension. The pretest, which demonstrated higher ratings of the pill's unpleasantness by subjects experiencing dissonance than subjects not experiencing dissonance, provided evidence that dissonance was, indeed, misattributed to the alternate source. Furthermore, the generality of the re-attribution effect in this context was demonstrated by the finding that ultimately subjects apparently attributed their tension to the source specified by the subsequent information regardless of the content of the initial information.

However, caution should be exercised in generalizing from these results in view of Calvert-Boyanowsky and Leventhal's (1975) recent criticism of misattribution of arousal experiments. These theorists have argued that subjects who experience arousal effects that are qualitatively or quantitatively different from the effects they have been led to expect, will, by virtue of this discrepancy, experience additional arousal. Since a placebo pill was used as the alternate tension source in this experiment, the response measures in all conditions of this experiment, excluding the condition in which subjects were informed only that the drug had no side effect, must be viewed in light of this criticism. While it is difficult to interpret the effect that bolstered tension might have on attitude measures in the two conditions in which the drug was subsequently described as being unpleasant, the attitude measure in the condition

where an initial unpleasant side effect designation was subsequently changed to a no side effect designation may well reflect this bolstering of tension. However, since the attitude measures in this condition are higher than in the other conditions, it is unlikely that the major conclusion of this experiment is endangered by this possible confound.

While the attitude measures in this experiment seem to indicate that the misattribution of 'dissonance' tension to an alternate source does not necessarily persevere, these findings do not specify the conditions under which re-attribution of this tension to the inconsistent cognitions is likely to occur. Determination of the conditions under which a person will re-attribute this tension to the inconsistent cognitions is a problem that seems to be tied to an understanding of the processes by which tension is attributed to a particular arousal source. Some theorists (Taylor & Fiske, 1978) have hypothesized that an individual will attribute arousal to whichever source is most salient in the environment. Drachman and Worchel (1976), however, have suggested that arousal may be attributed to the source which appears, to the individual, to lead to the least effort-involving arousal reduction response. According to this view, people are 'aware' of the inconsistent cognitions but choose to avoid the discomfort involved in attributing the tension to these cognitions by attributing the tension to the alternate source. This view is similar to Pallak's concept of dissonance avoidance. Pallak (1970) has argued that people may immerse themselves in cognitive activity in order to reduce the salience of the inconsistent cognitions or to avoid experiencing dissonance. The conditions under which people will re-attribute misattributed tension to the inconsistent cognitions may differ, then,

according to which, if any, of these views of tension attribution is correct. If the salience view of tension attribution is correct, perhaps the slightest focusing of attention by the individual to the inconsistent cognitions will trigger re-attribution. Such self-directed attention could result from remembering the inconsistent relations, or, as a consequence, of a search for a more satisfactory means of tension resolution. However, if Drachman and Worchel's suggestion is correct, focusing attention on the inconsistent cognitions might lead only to further resistance to re-attribution. Hence, re-attribution might only occur as a last resort. The present study offers some evidence that people can attribute 'dissonance' tension to a source other than the inconsistent cognitions despite being 'aware' of these cognitions. The subjects in this experiment who were provided with an alternate source to which to misattribute 'dissonance' tension, after they had apparently attributed their tension to the inconsistent cognitions, must have been aware of these cognitions. Nevertheless, the attitude measures indicated that these subjects apparently later misattributed this tension to the alternate source. A more exacting test of this hypothesis could be conducted by presenting dissonance-aroused subjects with both salient and effort-related plausible tension sources. Attribution measures could indicate the source to which the person attributed his tension.

Another limitation of the present study concerns the length of time that the subjects were exposed to the information regarding the drug side effects. Subjects were given the initial side effect information 5-10 minutes before dissonance was generated. The subsequent information was given 3-5 minutes after dissonance was

generated and the attribution measures were completed 3-5 minutes thereafter. It is possible that the choice of these particular durations of exposure time may have contributed to this particular pattern of results. Perhaps longer exposure to the initial information may aid attributional perseveration. Perhaps, also, the very short exposure to the subsequent information may have lessened the impact of the re-attribution effect. A study varying the exposure durations of the initial and subsequent information would be helpful in placing the conclusions of this experiment in a clearer perspective.

It should be noted that since the manipulation of subsequent information followed the subject's decision to write the essay (the dissonance manipulation), systematic bias in attrition rates could not contribute to the main effect obtained. Furthermore, since only two subjects from different conditions refused to write the essay, the possibility of systematic attrition in this experiment was negligible.

It should also be noted that the present study differs procedurally from other misattribution experiments in two respects. First, the subject sample was not restricted to a pre-tested group of subjects found to be in opposition to the position advocated in the essay. Assurances were made only that most members of the population from which the sample was drawn were opposed to this position. Second, the experimenter was not blind to the experimental conditions. It was decided that the need to insure participation in the study outweighed the benefits of being absent at the time the subjects were exposed to the drug side effects manipulation.

The present findings suggest that the range of situations in which attribution perseverance effects are likely to be found is more

restricted than currently appreciated. It is possible that perseverance effects can only be obtained under conditions in which a person has considerable 'evidence' to distort, and a reasonable time in that to engage in this distortion process. Perhaps also attributions of tension or arousal to a source comprise a class of impressions that are less likely than others to survive the complete negation of their evidential bases. Future research on attribution perseverance should attempt to delineate those situations and impressions which are most amenable to attribution perseverance effects.

While this study suggests certain avenues for future research, a more urgent need exists for research on the processes by which attributions of tension/arousal are made. For example, a major problem in this area concerns the attempt by Higgins et al. (1979) to redescribe dissonance as an aversive rather than an arousing state. It is unclear how the Schachterian model of undifferentiated arousal can be utilized in misattribution of dissonance research if dissonance is not an arousing state. Until a clearer understanding is gained of the processes by which attributions of arousal are made, it will not be possible to draw strong conclusions about misattribution and re-attribution of arousal phenomena.

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APPENDIX A

To aid in the interpretation of our results we are asking all participants at this time to answer a couple of questions on the rating scales provided below. Your responses to these questions will be kept confidential.

1. Please rate how challenging you felt the initial memory test was.

The initial memory test was:

1. ____	2. ____	3. ____	4. ____	5. ____	6. ____	7. ____	8. ____	9. ____
Not at all challenging				Extremely challenging				

2. Please rate your feelings regarding the side effects of the drug you were administered.

I feel the side effects of the drug are as follows:

1. ____	2. ____	3. ____	4. ____	5. ____	6. ____	7. ____	8. ____	9. ____
Not in the least unpleasant	Can notice very mild unpleasantness	Can notice mild un- pleasantness	Can notice moderate un- pleasantness	Can notice more than moderate unpleasantness				

APPENDIX B

December 14, 1978

To all participants in experiment: DYLAN 42,

The study in which you are participating is one of a number of studies that the Psychology Department is undertaking to investigate the effects of a new drug, M.C. 5771, on what is called 'short term memory'. While our knowledge of the exact effect of the drug on memory is incomplete, we have at least established that the drug is harmless. The drug has been certified as entirely safe by the C.M.A. While a particular form of the drug may produce a mild short term side effect, tests of over six thousand persons reveal that all effects of the drug wear off within forty minutes of the time of administration.

Brendan Gail Rule
Professor
Department of Psychology

APPENDIX C1

Short Term Memory Test Number One

Instructions: Please memorize as many of the following nonsense syllables as you can in the next 4 minutes.

R A B

N U D

S A N

D I S

W O D

R I T

S U P

B I R

F O S

C A G

V O N

P E D

Z E L

T U M

H A K

APPENDIX C2

Short Term Memory Test Response Sheet

Instructions: Please record below as many of the nonsense syllables as you can recall. You may report these in any order you wish.

[illegible]

APPENDIX D

Human Research Participation Consent Form

I, the undersigned, have read the letter from the department asserting the complete safety of the drug which will be used in the experiment DYLAN 42. I have also read the description of the side effects of the drug outlined herein:

"This M.C. 5771 pill contains elements which have no side effects at all."

I am also aware that all effects of the drug are to disappear after 40 minutes. I hereby consent to take part in experiment: DYLAN 42.

APPENDIX E

Human Research Participant Consent Form

I, the undersigned, have read the letter from Dr. Rule asserting the safety of the drug that will be used in the experiment DYLAN 42. I have also read the description of the side effects of the drug outlined herein:

"This M.C. 5771 pill contains chemical elements that are more soluble than other parts of the compound.

In this form of the drug these elements may produce a feeling of mild unpleasantness prior to the total absorption of the drug, 30 seconds after ingestion.

This side effect will disappear completely within 10 minutes."

I am also aware that all effects of the drug will disappear after 40 minutes. I hereby consent to take part in experiment: DYLAN 42.

APPENDIX F

Department of Psychology Short Term Memory Project

University of Alberta

Supplementary Information for Memory Project Participants:

1. The study in which you are participating is part of a project which is the first to demonstrate significant and stable increments in short term memory. Although research with college-aged participants has shown that placebo drugs can sometimes increase short term memory, the results have been, on the whole, rather poor. Special permission has been received from the Psychology Department to administer real, rather than placebo pills, in this experiment in order that the college-aged populations response to the drug can be determined and compared to the results found with aged participants.
2. Side effects - As your experimenter has informed you, some forms of the drug have noticeable side effects. Those participants who have been administered these forms of the drug will probably begin to experience these effects 30 seconds after ingestion of the capsule. The effects have been found to disappear 8-12 minutes after ingestion.
3. If you are interested in obtaining the final results of this study you are invited to write your name and address in the space provided below and we will be more than happy to send you a summary of same.

APPENDIX G

Psychology Department Attitude Survey 1978-9

Instructions: Below are listed a number of issues of current interest to the Psychology Department. The department is primarily interested in determining why people feel as they do toward these issues, but is also interested in determining what the general reaction of people is to these issues. Could you please rate on the scale provided below your feelings on the following issues. The responses that you give will remain strictly confidential. Please give some thought to each question before answering as your responses are quite important to the department.

To what extent are you in favour of:

1. abolishing course grading at the University of Alberta?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

2. the chartering of a new University in Alberta?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

3. the University of Alberta's entrance requirements being relaxed?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

4. 6:30 A.M. classes being instituted at the University of Alberta?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

5. Saturday classes being instituted at the University of Alberta?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

6. more night classes being instituted at the University of Alberta?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

7. having half the Heritage Fund spent on the current needs of the province?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

8. the legalization of all hallucinogenic drugs?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

9. drastically reducing immigration to Canada for a five year period?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

10. a military draft being instituted in Canada?

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___ 11. ___

Extremely
opposed

Extremely
in favour

B30257